WHAT IS CLAIMED IS:

1. A method of operating an optical inspection system to determine characteristics of surface topology of a substrate disposed in a processing system, the optical inspection system comprising a signal processing unit, a first light source configured to emit a first optical signal, a second light source configured to emit a second optical signal, a receiver unit connected to the first and second light sources and the signal processing unit, the method comprising:

while the substrate is moving along a transfer plane and while the second light source is disabled, illuminating a substrate surface with the first optical signal from the first light source positioned at a first location relative to the substrate;

while the substrate is moving along the transfer plane and while the first light source is disabled, illuminating the substrate surface with the second signal from second light source positioned at a second location relative to the substrate and different from the first location;

receiving, at the receiver unit disposed between the first and second light sources, a portion of the first signal and a portion of the second signal;

generating, at the signal processing unit, signal-signature information for the substrate representing the characteristics of the first and second signal portions;

processing the signal-signature information of the first and second signal portions to derive a first signal image and a second signal image;

generating a three-dimensional image of the substrate surface using the first and second signal images.

2. The method of claim 1, wherein the first and second direction comprise linear motion, nonlinear motion, and any combination thereof.

3. The method of claim 1, further comprising comparing the three-dimensional image to a reference three-dimensional image.

4. The method of claim 3, further comprising:

determining a difference between the three-dimensional image and the reference image;

determining whether the difference between the three-dimensional image and the reference three-dimensional image exceeds a predetermined value; and

if the difference exceeds the predetermined value, determining that an unacceptable level of contamination exists on the substrate.

5. The method of claim 4, wherein the unacceptable topographical condition pertaining to the condition of the substrate comprises substrate reflectivity information, specular information, spectral information, substrate defect information, substrate damage information, particle contamination information, alphanumeric character information, and any combination thereof.

6. The method of claim 1, wherein generating signal-signature information comprises determining a first number of three-dimensional image data at a given intensity for a range of specular intensity values for the first and second signals.

7. The method of claim 6, wherein the reference three-dimensional image comprises a second number of three-dimensional image data at the given specular intensity for the range of specular intensity values and wherein determining the difference between the three-dimensional image and the reference image comprises determining a difference between the first number of three-dimensional image data and the second number of three-dimensional image data.

8. The method of claim 1, wherein the reference three-dimensional image represents a topographical image of a reference substrate having desired processing characteristics.

9. The method of claim 1, wherein the substrate is moved toward the first light source while illuminating the substrate surface with the first signal and wherein the substrate is moved toward the second light source while illuminating the substrate surface with the second light source.

10. The method of claim 1, wherein the substrate is moved toward the first light source while illuminating the substrate surface with the first signal and wherein the substrate is moved away from the second light source while illuminating the substrate surface with the second light source.

11. The method of claim 1, wherein the receiver unit is one of a charge-coupled device (CCD) camera and a spectrometer.

12. The method of claim 11, wherein the first signal is propagated along a first axis oriented at about orthogonally to a second axis along which the second signal is propagated.

13. An optical inspection system, comprising:

a first light source positioned in a first location and configured to emit a first signal along a first optical path oriented at a first acute angle relative to a substrate transfer plane;

a second light source positioned in a second location different from the first location and configured to emit a second signal along a second optical path oriented at a second acute angle relative to the substrate transfer plane, and wherein the first and second light sources are configured to operate alternatively with respect to one another while inspecting a substrate; and

a receiver unit disposed between the first light source and the second light source and oriented along an axis perpendicular to the transfer plane; wherein the receiver unit is configured to receive at least one of scattered and reflected light from the substrate moving along the transfer plane.

14. The optical inspection system of claim 13, further comprising a robot including a substrate support member configured to move the substrate along the transfer plane.

15. The optical inspection system of claim 13, wherein the first and second light sources and the receiver unit are disposed on a front-end environment integral to the processing system.

16. The optical inspection system of claim 13, wherein the first and second light sources and the receiver unit are disposed on a lid of a vacuum chamber.

17. The optical inspection system of claim 13, wherein the receiver unit is selected from one of a CCD camera and a spectrometer.

18. The optical inspection system of claim 13, further comprising a signal processing unit connected to the receiver unit and configured to:

generate signal-signature information for the substrate representing the characteristics of the first and second signal portions;

process the signal-signature information of the first and second signal portions to derive a first signal image and a second signal image; and

generate a three-dimensional image of the substrate surface using the first and second signal images.

19. The optical inspection system of claim 18, wherein the signal-signature information comprises one of spectral intensity value, specular intensity value, and any combination thereof.

20. The optical inspection system of claim 18, wherein the signal processing unit is further configured to compare the three-dimensional image to a reference three-dimensional image.

21. The optical inspection system of claim 20, wherein the signal processing unit is further configured to determine whether a difference between the three-dimensional image and the reference three-dimensional image exceeds a predetermined value; and if the difference exceeds a predetermined value, determine that an unacceptable topographical condition exists on the substrate surface.

22. The optical inspection system of claim 21, wherein the unacceptable topological condition comprises substrate reflectivity information, specular information, spectral information, substrate defect information, substrate damage information, particle contamination information, alphanumeric character information, and any combination thereof.